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RECEIVED

20 MAR 2002

MILLER STURT KENYON

Datum/Date

20.03.02

Zeichen/Ref./Réf.

EPP13113A

Anmeldung Nr./Application No./Demande n°.Patent Nr./Patent No./Brevet n°.

99307402.0-2208-

Anmelder/Applicant/Demandeur/Patentinhaber/Proprietor/Titulaire

Seiko Instruments Inc.

COMMUNICATION

The European Patent Office herewith transmits as an enclosure the European search report for the above-mentioned European patent application.

If applicable, copies of the documents cited in the European search report are attached.

☐ Additional set(s) of copies of the documents cited in the European search report is (are) enclosed as well.

The following specifications given by the applicant have been approved by the Search Division:

☐ abstract

☒ title

☒ The abstract was modified by the Search Division and the definitive text is attached to this communication.

The following figure will be published together with the abstract:

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REFUND OF THE SEARCH FEE

If applicable under Article 10 Rules relating to fees, a separate communication from the Receiving Section on the refund of the search fee will be sent later.





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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 7 March 2002	Examiner Köpf, C
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 99 30 7402

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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ABSTRACT / ZUSAMMENFASSUNG / ABREGE

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An ultrasonic motor with an increased driving force is provided.

There is provided a bimorph type piezoelectric actuator (1) formed by integrally stacking six piezoelectric elements (11,12,13,14,15 and 16). The piezoelectric element (12) is thinner than the piezoelectric element (11), and expands and contracts in the same direction as that of the piezoelectric element (11) at the same voltage, and the piezoelectric element (13) is thinner than the piezoelectric element (12), and expands and contracts in the same direction as that of the piezoelectric element (11) at the same voltage. The piezoelectric element (14) contracts and expands oppositely to the piezoelectric element (11) at the same voltage; the piezoelectric element (15) is thinner than the piezoelectric element (14), and contracts and expands in the same direction as that of the piezoelectric element (14) at the same voltage; and the piezoelectric element (16) is thinner than the piezoelectric element (15) and contracts and expands in the same direction as that of the piezoelectric element (14) at the same voltage. Therefore, the expansion and contraction of each of the piezoelectric elements (11,12,13,14,15 and 16) contribute to a driving force without interfering with the expansion and contraction of the other piezoelectric elements.

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